

INDOT 2030 Long Range Plan

Introduction and Background

Introduction

Predicting the future is a difficult task. The Indiana Department of Transportation (INDOT) 2030 Long Range Plan provides a vision for the future development of the INDOT state transportation system focusing on the highway network. This Plan supplements, but does not replace the earlier multimodal statewide plan, *Transportation in Indiana: Multimodal Plan Development for the 1990's and Beyond*, updating the highway system chapter. The 2030 Long Range Plan outlines a strategy for future investments in the state highway system. These investments are intended to provide Hoosiers the highest level of mobility and safety possible and to meet the needs of economic development and quality of life into the next quarter century.

This Plan focuses on identifying and prioritizing specific highway expansion projects. Expansion projects are defined as improvements that provide additional capacity to a roadway (e.g. added travel lanes, new road construction, interchange modifications, and new interchange construction). This document will provide guidance to the development of added travel lanes in pavement replacement, bridge, and interchange projects. INDOT strives to coordinate and synchronize multiple projects, thereby minimizing disruptions to the traveling public.

The Long Range Plan is also intended to provide information for project development on priority highway corridors. These priority corridors will receive roadway improvements to better serve through traffic needs, including improvements to better accommodate truck travel. In many cases, these corridors will not warrant additional travel lanes due to lower levels of forecasted travel or severe right-of-way constraints which limit the range of potential improvements. For these situations in areas where highway expansion improvements would be considered, the Long Range Plan identifies a proposed roadway improvement concept of upgrading the existing two lane roadway through resurfacing, restoration, rehabilitation, and reconstruction to a higher design standard. This information is intended to provide a vision of how INDOT envisions the state highway system developing into the future.

The Plan will also provide guidance in short-range planning through the INDOT Program Development Process, which is conducted jointly with the INDOT Districts and the state's Metropolitan Planning Organizations (MPO). The 2004-2030 Long Range Plan has been developed with the input of the MPOs and the INDOT District project development offices.

While this document limits attention to highway expansion, the core of INDOT's highway program is, and will continue to be, focused on maintaining the existing roads, bridges, and traffic control devices on the state highway system. Maintenance of the existing infrastructure falls under the generalized heading of preservation. Chapters 8 and 10 demonstrate this commitment through our continued allocation of the majority of highway funding to system

preservation activities. Identification of needs, project development, and prioritization for system preservation projects are done through a systematic process involving the District Development Offices and the Central Office Program Development Division, particularly through the bridge, pavement and safety management systems.

The 1995 Statewide Plan

The 1995 Statewide Long-Range Multimodal Transportation Plan entitled *Transportation in Indiana: Multimodal Plan Development for the 1990's and Beyond* was officially adopted by INDOT on December 21, 1994. The 1995 Statewide Plan and the associated Policy Plan component, *Multimodal Issues, Policies and Strategies for the 1990's and Beyond*, remain in effect to provide a comprehensive guide for future INDOT activities. The policy plan identifies the following nine multimodal issue and policy statements:

Transportation System Effectiveness

INDOT will strive to develop an efficient and well-integrated multimodal transportation system. This will be pursued through cost-efficient and cost-effective management and maintenance of existing facilities and services, through appropriate expansion of capacity, and through removal of bureaucratic constraints to efficient and effective transportation of people, goods and freight.

Transportation Safety

INDOT will work to ensure that safety is considered and implemented, as appropriate, in all phases of transportation planning, design, construction, maintenance, and operations. INDOT will strive to raise the safety awareness of both the transportation industry and users of transportation facilities. INDOT will work closely with other local, state, and federal agencies to improve information reporting on transportation crashes, exposure to risks, and trend analysis, in order to identify potential safety problems, analyze potential solutions and implement appropriate actions.

Demographic Changes and Quality of Life

INDOT is committed to develop a transportation system that responds to demographic change and contributes to the quality of life. INDOT will provide safe and efficient intermodal access to the diverse business, recreational, and cultural opportunities of Indiana.

Transportation Finance

INDOT supports adequate and reliable funding for Indiana's transportation system from all sources: federal, state, and local governments; and the private sector.

Intergovernmental Coordination

INDOT will actively solicit greater coordination and cooperation with other agencies, units of government and other stakeholders with the goal of developing a state transportation plan that will guide the selection of investments that offer the best value while providing support for Indiana's continued economic growth.

Economic Development

INDOT has a unique role in sustaining and fostering Indiana's economy and recognizes that policy decisions and transportation infrastructure investments have major effects on economic growth and development. To support economic competitiveness, INDOT will improve upon Indiana's high quality transportation system to reduce the cost of moving people, goods, and freight, connect Indiana with regional, national, and international markets, provide communities with an edge in competing for jobs and business locations, and connect people with economic opportunities.

Natural Environment and Energy

INDOT will establish and maintain a transportation system that is consistent with the state's commitment to protect the environment. INDOT will contribute to energy conservation efforts by promoting efficiency in all modes of travel and by encouraging the most efficient use of transportation systems.

Bicycle and Pedestrian Facilities

INDOT will support non-motorized modes of travel as a means to increase system efficiency of the existing surface transportation network, reduce congestion, improve air quality, conserve fuel and promote tourism benefits. INDOT will work to remove unnecessary barriers to pedestrian and bicycle travel.

New Technology

INDOT will provide leadership for the State of Indiana to develop and deploy advanced transportation technologies. INDOT will embrace a broad-based, comprehensive research program to support all elements of intermodal transportation.

Transportation Trends

I. CHANGES TO THE DEMANDS ON THE TRANSPORTATION SYSTEM

Changes in Production Processes

In order to compete in the global economy, firms in the United States have in recent years restructured their manufacturing processes with an emphasis towards increased production efficiency and quality. On-site inventory levels have been reduced through the use of a concept that is commonly known as "just-in-time delivery". As its name suggests, just-in-time delivery in the manufacturing process requires that part components and materials be delivered to the manufacturing assembly point as and when needed. This concept reduces the need for costly warehousing and increases the demand for an efficient and reliable transportation system. Finished products are frequently shipped directly to the customer shortly after production.

The rise of the Internet and the application of business-to-business software have also helped to streamline and accelerate the manufacturing process. Orders for products can now be placed and processed in "real time". Computer integrated manufacturing systems can automatically monitor and record part component and material consumption in the assembly

process thereby increasing the timeliness of placing and fulfilling orders for product production and delivery.

Just in time delivery places greater demand and expectations upon the transportation infrastructure. Demand increases as more freight is transported along the highway system at any given point in time. The efficiency of the transportation system affects travel time and delivery of materials and products from plant to plant and from plant to retail outlet.

Location of Economic Activity

Because of the information revolution and advances in telecommunication and computer technology, many firms are now capable of separating parts of their production process. Management, research and development, and various phases of production can each be located optimally for function.

Businesses not requiring extensive face to face contacts have recently shifted their operations from the traditional urban locations to suburban or rural locations. A host of businesses of this type have formed because of the advances in telecommunications and computer technology, and the availability of “instant” on-line information. This trend will very likely persist with continued advances in electronic information networks and telecommunications technology.

II. ECONOMIC AND DEMOGRAPHIC TRENDS AFFECTING TRANSPORTATION

The demand for transportation is intrinsically linked to economic and demographic conditions. The following provides data and descriptions of: 1) broad economic trends; 2) Indiana-specific growth – historical and projected; 3) industry-specific trends – which industries are growing and declining; and 4) demographic changes in Indiana, including an overall aging of the population. The data used to support this analysis is based on the statewide Indiana REMI model (Regional Economic Models, Inc.), which was also used to conduct the economic impact analysis of the Long Range Plan. That analysis focused on transportation investments that affect the cost of travel, and consequently the productivity and cost benefits to businesses and individuals in the state. Ultimately, that analysis correlates transportation investments to employment, personal income, and gross state product (GSP). A look at long range economic and demographic trends provides a baseline and most likely economic scenario to consider the demand for transportation and how changes in the economy and population will alter transportation needs.

National and International Economic Trends

There are a few key trends in the national and global economies that directly relate to transportation services, modes, and demand:

- **Increased importance of international trade.** International trade as a share of economic activity has grown over the past thirty years, and that trend is projected to continue. For example, at the United States level, the combination of exports and imports as a share of gross domestic product (GDP) has increased from 11 percent in 1970 to 29 percent in 2000 and is expected to grow to 39 percent by the year 2020.
- **Advances in global supply chains and logistics.** The movement of goods has gradually shifted from a “push” logistics system to a “pull” system that is dominated by consumer demand. Rather than a supply-side system, the transportation of goods and services is increasingly dictated by demand, and firms have responded by becoming more nimble, with an increasing share of

freight moving by trucks and air as opposed to rail and marine. At the same time, “just-in-time” logistics processes are consistent with smaller on-hand inventories, and require efficient logistics firms to help move goods.

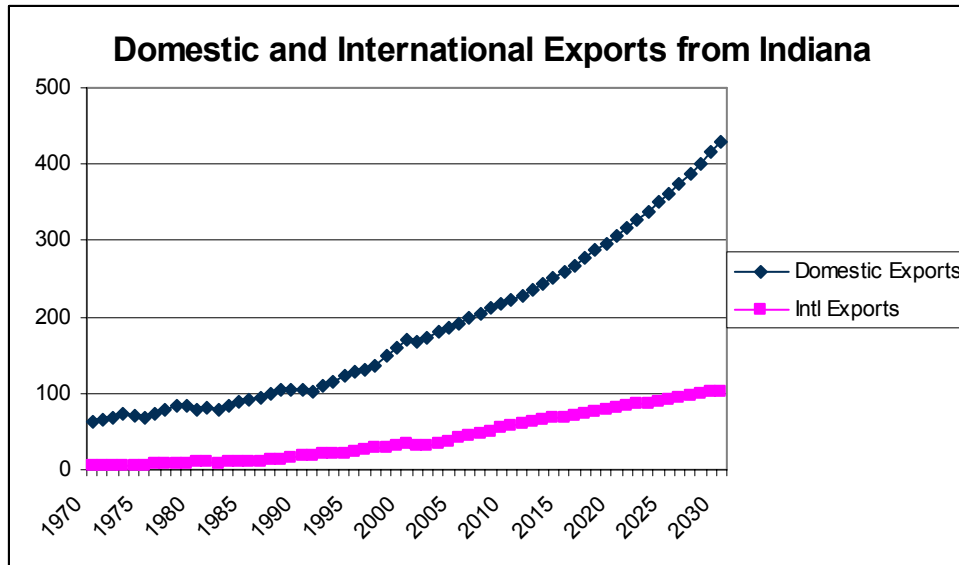
- **Continuing shift from a manufacturing economy to a service economy.** As suggested by many economists, the United States has gradually shifted from an economy where the majority of workers were concentrated in agrarian activities, to an economy highlighted by manufacturing and industrial growth, to an economy where the largest share of workers are in service sectors. For a comparison, four percent of total employment was in farming in 1970 and this number shrank to two percent by 2000 and is not expected to rise. In terms of manufacturing, 22 percent of all jobs in 1970 were in manufacturing compared to 11 percent in 2000, and a projected 10 percent share in 2030. Service Sector jobs accounted for 19 percent of all jobs in 1970, 32 percent in 2000, and are expected to grow to 39 percent by 2030. Still, due to rapid increases in productivity, manufacturing production (business output) has grown even during times of employment declines, and that is probably the most relevant data to freight transportation demand.
- **Aging population.** Two demographic trends are both pointing towards an aging U.S. population over the next 20 to 30 years. First, advances in science and medicine have increased life expectancies. Second, the baby boomer population is steadily heading towards retirement ages. This trend has implications in terms of labor force availability and the percentage of the population employed compared to those relying on services from others. It also impacts transportation in terms of the needs of the elderly (i.e., transit, safety, etc.).

Indiana Specific Economic Trends

Today's Indiana economy produces over \$230 billion of economic activity (as measured by GSP), enjoys approximately \$185 billion in personal income, with employment of 3.6 million. Employment increased by 18 percent from 1990 to 2004, but is currently projected to grow by just 15 percent to the year 2030 – a significantly slower pace of employment growth. Meanwhile, GSP grew by 56 percent from 1990 to 2004 and real personal income (adjusting for inflation) increased by 44 percent. Future growth in GSP and personal income is also expected to be slower on an annual basis than in recent years, but is expected to grow faster than employment. Consistent with relatively rapid increases in personal income, per capita personal income has grown significantly over time, and in many ways is the best measure of economic well-being. In 1970, per capita income in Indiana was \$14,500 (in 1996 dollars). Today, it is approximately \$29,000 and is expected to grow to roughly \$45,000 by 2030. Indiana's per capita income is very similar to the United States overall today (slightly higher) and is expected to be 2.5 percent than the U.S. by 2030.

Domestic and International Export Trends

As shown below, both domestic and international exports have historically increased at a steady pace and are expected to experience continued growth out to 2030. In 2004, Indiana will export roughly \$38 billion in goods and services to international trading partners, and another \$185 billion to other states. It's interesting to see the relative importance of exports from Indiana to other states within the U.S. (domestic) versus international exports. Though both trends are clearly upward, it's the domestic portion that is actually expected to increase the most rapid growth and grow to over \$400 billion by 2030.



Indiana Industry-Specific Trends

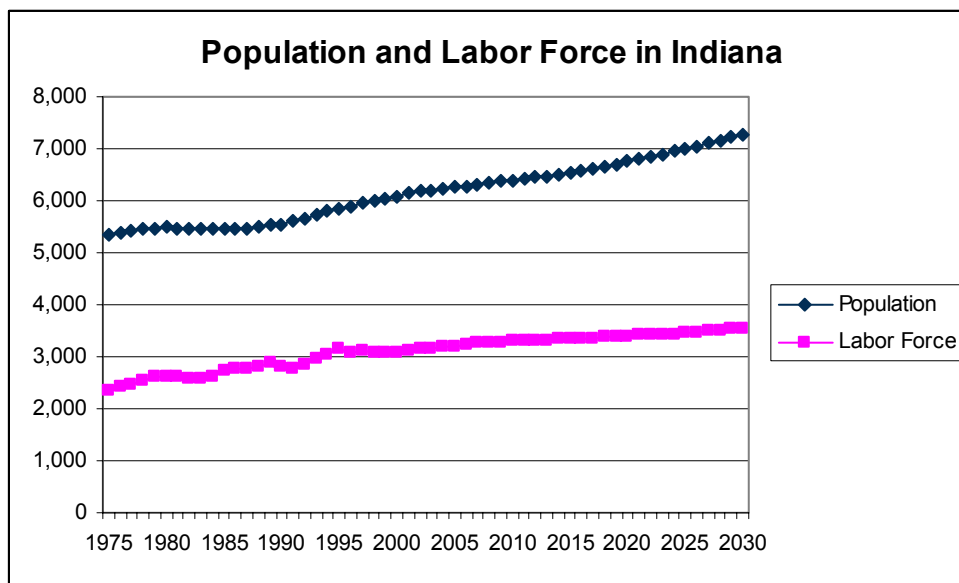
The table below presents employment by industry in the major sectors of the economy for both historical time periods and a forecast of future conditions. Though manufacturing employment is expected to decline through 2010, it is projected to reverse course and increase to over 740,000 jobs by 2030 based on a generally larger economy. The services and retail trade industries are projected to continue on a growth path and by 2030, those two industries will account for over two million of Indiana's 4.2 million jobs. As population gradually increases, so will the demand for government resources. Government employment in Indiana only trails services, manufacturing, and retail trade. The transportation and public utilities industries are expected to experience steady growth in the future, accounting for 188,000 jobs by 2030.

Indiana Employment by Industry (thousands)								
	1970	1980	1990	2000	2004	2010	2020	2030
Manufacturing	717.4	665.9	648.2	697.6	634	628.9	673.8	742.5
Mining	8.9	13.6	12.3	8.6	6.1	5.2	4.5	4.1
Construction	106.2	125.3	165.3	215.8	203.5	208.9	210.1	213.5
Transportation & Public Utilities	114.7	123	152.8	177.2	172.4	182.9	185.7	188.4
Finance & Insurance	126.4	169.2	183.4	235.6	234.5	237.8	236.9	236.1
Retail Trade	357.3	440.4	550.7	656.7	654.1	652.4	659	660.5
Wholesale Trade	85.7	113.5	135.3	157.7	143.3	139.3	135	127.8
Services	340.9	484.8	735.1	998.4	1024.9	1125.9	1249.1	1387
Agriculture & Forest Services	6.6	11.5	21.9	33.5	37.9	43.8	57.6	75.9
Total Government	307.2	367.5	399.3	431.8	446.7	460.9	471.2	493.1
Farm	119.6	117.5	86.8	79.3	76.9	73.1	66.1	59.8
Total Employment	2290.9	2632.2	3091	3692.2	3634.3	3759	3949.1	4188.7
source: Regional Economic Models, Inc.								

Some of the more detailed industries that are projected to increase in employment most rapidly from 2004 to 2030 include: machinery and computers (114 percent); agriculture, forestry and fishing services (100 percent); medical and technical instruments (100 percent); and miscellaneous business services (67 percent).

Demographic Trends in Indiana

Indiana's population in 2000 was 6.1 million and is projected to be up to 6.2 million in 2004. As shown in the graphic below, both population and labor force are on a gradual upward trend since 1975 and are projected to grow to 7.3 million people and 3.5 million labor force by 2030. As described in the broad national trends section, the aging of the population will slightly reduce the number of people able to work relative to the total population. In 2000, the participation rate (labor force divided by population) was estimated to be almost 51 percent. This ratio is projected to hit a maximum in 2008 at near 52 percent, but by 2030 will decrease to approximately 48 percent as the baby boomer generation ages.



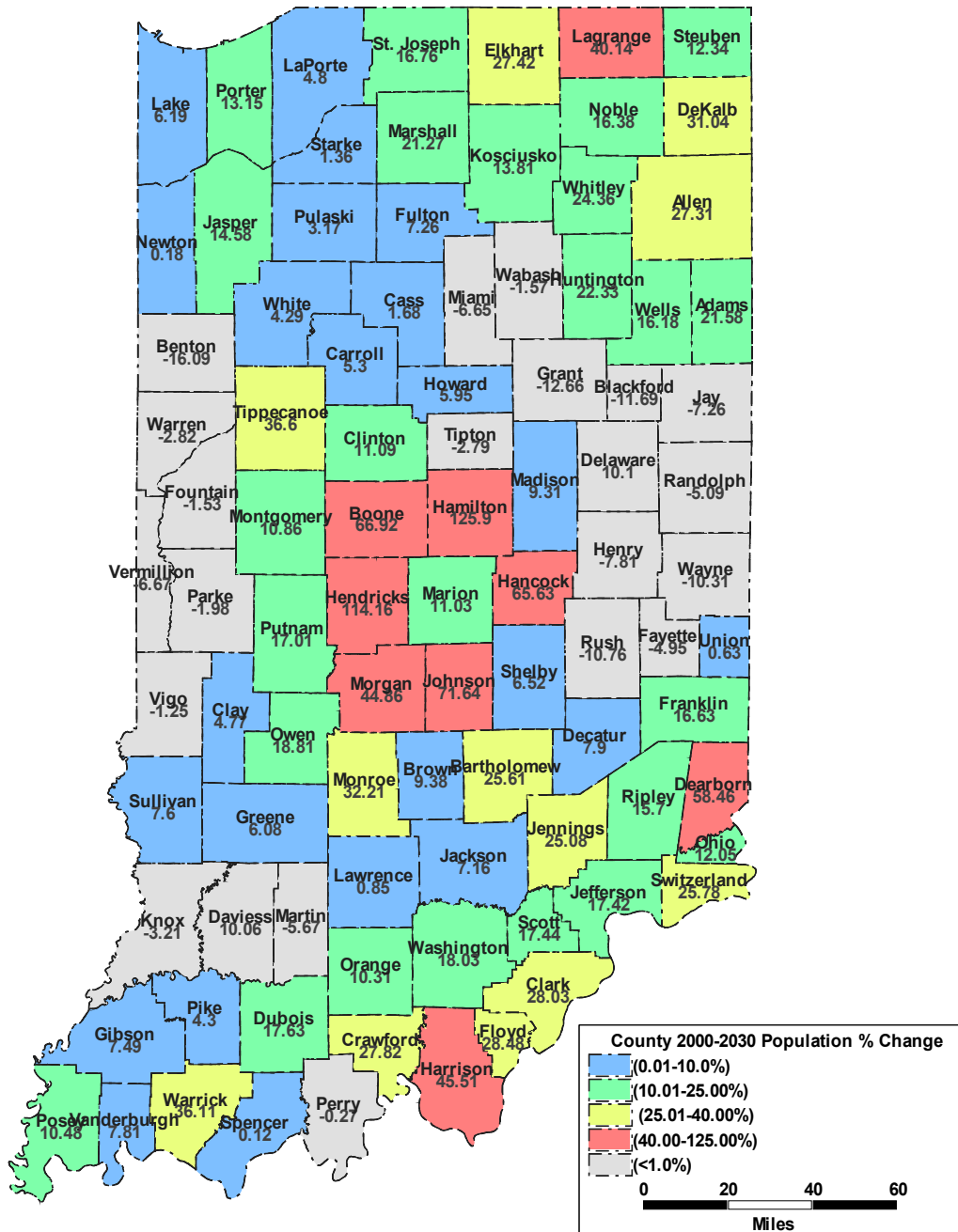
To further illustrate these demographic changes, consider the percentage of the population in different age cohorts in the years 2004 and projections to 2030:

- For the zero to 19 age cohort, primarily children in school or not in the labor force, the 2004 share is 29 percent but is expected to fall to 27 percent even though the total number will grow by almost 200,000.
- For the 25-44 age cohort, often considered prime working ages, their share of total population is estimated to decline from 28 percent to 24 percent by 2030, with only an increase in population of 5,000.
- For the 70 and over age cohort, however, the trend is much different. The share in 2004 is less than nine percent, but is expected to grow to over 14 percent by 2030, representing an increase in population of nearly 500,000.

Indiana Population Growth over the Next 30 Years

The map below shows the change in population in Indiana by county. This reflects the population changes for the years 2000 to 2030. As is typical, several counties show a decline in population while others show a significant growth.

Indiana County Population 2000-2030 % Change



III. TRANSPORTATION TECHNOLOGY TRENDS

Congestion Pricing

A congestion cost is a user charge based on a user's perceived cost when entering the traffic stream and the actual congestion cost created by the traveler's entry onto the system. Congestion pricing results in more efficient use of limited road capacity during peak periods by encouraging those who value their trips at less than their full cost to shift to off-peak periods. Other options include alternate routes, car pooling, or mass transit.

Proponents argue that the demand for urban travel is continually growing and that congestion pricing provides a solution when the construction of additional road capacity is not possible. In addition, advocates maintain that electronic tolling technologies can greatly reduce implementation costs and that congestion pricing is a cost-effective strategy for the reduction of mobile source air emissions and energy consumption.

In contrast, adversaries of congestion pricing contend that issues such as public opposition to new taxes, geographic and economic equity concerns, lack of regional coordination, and a lack of alternatives to driving alone during peak hours are all problematic when attempting to implement congestion pricingⁱ. In addition, opponents argue that changes in pricing may not significantly affect consumer demand and that the primary result may be adverse effects on the poor.

Intelligent Transportation Systems

Intelligent Transportation Systems (ITS) include a broad range of diverse technologies which can be used by transportation managers to automate and monitor transportation and inform travelers about their options. The intelligent transportation infrastructure includes real time traffic information, in-vehicle navigation systems, automatic incident detection and management, advanced traffic surveillance control, electronic toll collection, and automated vehicle identification and clearance for commercial vehicles. When combined, these technologies are expected to save lives, time, and money.

High Speed Rail

High speed rail, also known as high speed ground transportation, is a self-guided system that generally travels between 90 and 300 miles per hour which makes it time competitive with air and/or auto on a door to door basis for trips of 100 to 150 miles. The Midwest Regional Rail Initiative concerns Indiana and involves updating existing rail lines for high-speed travel. High-speed rail includes a family of technologies that range from upgraded wheel-steel on rails to magnetically levitated vehicles.

Alternative Fuels

Alternative fuels are non-traditional fuels that yield energy security and environmental benefits. There are two categories of alternative fuels, cleaner burning gasoline (oxygenated fuels), and fuels used in alternative fuel vehicles. Fuels available for use in alternative fuels include Methanol (M85), Compressed Natural Gas (CNG), Ethanol (E85), Liquid Petroleum Gas (LPG), and Liquefied Natural Gas (LNG). In addition, electric vehicles provide an alternative to petroleum burning vehicles. Currently, Indiana houses 84 alternative fuel filling stations. That number is expected to rise dramatically in the next 25 years.

Several benefits result from the use of alternative fuels and include an improvement in air quality, the reduction of greenhouse gas emissions, and the reduction of health care costs. Moreover, new technology is created with the development of alternative fuels and jobs are created. Finally, some organizations believe the conversion to alternate fuels will help reduce the national deficit, reduce dependency on foreign nations and therefore, enhance national security.

Safety

Several trends in the realm of safety will continue and expand throughout the next 25 years. Concerning safety trends, air bag technology is of utmost importance. Recently, an air bag rule was created by the National Highway Transportation Safety Administration to ensure that in the future air bags do not pose an unreasonable risk of serious injury to occupants who are near the bag when it deploys. In order to comply with this rule, several air bag technologies have emerged which include reduction in deployment time, occupant proximity sensing, and control of air bag inflation.

In addition to air bag safety trends, several ITS safety technologies will continue to emerge through the year 2025. Some technologies include rear-end collision avoidance, intersection collision avoidance, road departure collision avoidance, lane change/merger avoidance, heavy vehicle stability enhancement, drowsy driver monitors, driver vision enhancement, and heavy truck braking and electronic braking systems.

Needs of the Future

Continuation of Needs Stated in 1995 Plan

Needs previously stated in the 1995 Statewide Plan remain viable today. They include the continued improvement of the aesthetics of facilities, roads, and bridges in Indiana and a minimization of the adverse effects on environmentally sensitive areas. In addition, institutional barriers to the state's transportation system need to be identified and eliminated for citizens with disabilities who require specific modes of transportation, and for commercial vehicles that need to travel efficiently across many states. Finally, the expansion of high quality service as well as reduction in user costs for each dollar spent on Indiana's transportation system needs continual attention in the next 25 years.

Needs of an Aging Population

Forecasts by the Indiana State Department of Health show that the elderly are one of the fastest growing segments of Indiana's population. This drastic increase will result in additional transportation needs. Differences exist in the needs of the urban versus the rural elderly. Currently, 30% of Indiana's metropolitan areas and 50% of Indiana's non-metropolitan areas are not served by either public transit or taxis. Transportation for this group is mainly provided by family or social service agencies. As the elderly population of Indiana continues to increase in the next 25 years, the need for additional passenger services intensifies.

We are faced with the challenge of meeting the essential transportation needs of an aging population. Elderly drivers have unique needs within the conventional transportation system; those who will lose the personal mobility option deserve reasonable alternatives.

Economics

Investment in transportation can be very effective in promoting productivity, economic growth, and improved living standards. The continual evaluation and investment in transportation is an economic necessity. In addition, innovation in transportation is of utmost importance. Innovation drives the emerging global economy; therefore, innovation in transportation is critical to economic growth.

Transportation innovation causes the economy to expand and therefore, median household income increases. With increasing income comes increased spending on goods as well as travel. The increased amount of travel will create a greater need for road maintenance and construction in Indiana over the next 25 years.

Summary

Over the next 25 years, changes in the production process and the location of economic activity as well as the rise of the service sector, an increase in telecommuting, and the aging of the population will impact future transportation needs. Moreover, transportation technologies such as congestion pricing, ITS, high speed rail, and alternative fuels will influence transportation. This plan has been developed to meet current transportation needs, and to adapt to transportation trends and technology in order to meet the needs of Indiana's citizens over the next 25 years.

The changes in transportation trends as well as the continual advancement of technologies are an integral part of the 25 year transportation plan. The following chapters (2-5) illustrate the planning process, public involvement, multimodal coordination, and air quality issues, each of which provide an integral portion of Indiana's long range transportation plan.
